UNIVERSITY OF MINNESOTA
Driven to Discover℠

Twin Cities Campus

Ecology, Evolution, and Behavior B.S.

Ecology, Evolution & Behavior

College of Biological Sciences

- Program Type: Baccalaureate
- Requirements for this program are current for Spring 2012
- Required credits to graduate with this degree: 120
- Required credits within the major: 73 to 85
- Degree: Bachelor of Science

Students majoring in ecology, evolution, and behavior (EEB) focus on three related areas of biology. Ecology examines the growth and maintenance of populations and their interactions in communities, and relationships among organisms and physical events in terrestrial and aquatic ecosystems. Evolution investigates the origin and change of biological diversity by studying evolutionary patterns and processes at various temporal and spatial scales. Behavioral biology explores behavioral adaptations to the environment, mechanisms of behavior, and the evolution of social systems.

A B.S. in EEB prepares students for graduate study in integrative biology and related biological sciences; careers in teaching; and entry-level scientist positions in industry, government agencies, nonprofit agencies, and universities.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Admission Requirements

Freshmen students are usually admitted to pre-major status before admission to this major

A GPA above 2.0 is preferred for the following:

- 2.50 transferring from another University of Minnesota college
- 2.50 transferring from outside the University

For information about University of Minnesota admission requirements, visit the Office of Admissions website.

General Requirements

All students are required to complete general University and college requirements including writing and liberal education courses. For more information about University-wide requirements, see the liberal education requirements.Required courses for the major or minor in which a student receives a D grade (with or without plus or minus) do not count toward the major or minor (including transfer courses).

Program Requirements

Quantitative Requirement

MATH 1271 - Calculus I [MATH] (4.0 cr)
BIOL 3272 - Applied Biostatistics (4.0 cr)
or MATH 1272 - Calculus II (4.0 cr)
or STAT 3011 - Introduction to Statistical Analysis [MATH] (4.0 cr)
or CSCI 1901 *{Inactive}*(4.0 cr)
or CSCI 3003 - Introduction to Computing in Biology (3.0 cr)

Chemistry

CHEM 1021 *{Inactive}*[PHYS] (4.0 cr)
CHEM 1022 *{Inactive}*[PHYS] (4.0 cr)
CHEM 2301 - Organic Chemistry I (3.0 cr)
CHEM 2302 - Organic Chemistry II (3.0 cr)
or EEB 4611 - Biogeochemical Processes (3.0 cr)

Physics

PHYS 1201W *{Inactive}*[PHYS, WI] (5.0 cr)
or PHYS 1301W - Introductory Physics for Science and Engineering I [PHYS, WI] (4.0 cr)
PHYS 1202W *{Inactive}*[PHYS, WI] (5.0 cr)
or PHYS 1302W - Introductory Physics for Science and Engineering II [PHYS, WI] (4.0 cr)

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General Biology
BIOL 2002 *{Inactive}*[BIOL] (6.0 cr)
or BIOL 2002H *{Inactive}*[BIOL] (6.0 cr)
BIOL 2003 - Foundations of Biology for Biological Sciences Majors, Part II (3.0 cr)
or BIOL 2003H - Foundations of Biology for Biological Sciences Majors, Part II (3.0 cr)
BIOL 3004 - Foundations of Biology for Biological Sciences Majors, Part II Laboratory (3.0 cr)
or BIOL 3004H *{Inactive}*(3.0 cr)

Organismal Biology
Courses or course pairs must be from two different groups.
Take 2 or more course(s) from the following:
Animal Biology
•BIOL 2012 *{Inactive}*(4.0 cr)
or BIOL 3211 - Physiology of Humans and Other Animals (3.0 cr)
BIOL 2005 - Animal Diversity Laboratory (2.0 cr)
or PHSL 3051 - Human Physiology (4.0 cr)
BIOL 2005 - Animal Diversity Laboratory (2.0 cr)
or PHSL 3061 - Principles of Physiology (4.0 cr)
BIOL 2005 - Animal Diversity Laboratory (2.0 cr)
•Plant Biology
•PMB 2022 - General Botany (3.0 cr)
or PMB 3007W - Plant, Algal, and Fungal Diversity and Adaptation [WI] (4.0 cr)
or PMB 3002 - Plant Biology: Function (2.0 cr)
PMB 3005W - Plant Function Laboratory [WI] (2.0 cr)
•Microbiology
•VBS 2032 - General Microbiology With Laboratory (5.0 cr)
or MICB 3301 - Biology of Microorganisms (5.0 cr)

Biology Core
BIOL 3807 and 3811, which are summer courses offered at the Itasca Biological Station, can count toward the biology core and the field/lab experience.
BIOC 3021 - Biochemistry (3.0 cr)
or BIOC 4331 - Biochemistry I: Structure, Catalysis, and Metabolism in Biological Systems (4.0 cr)
BIOL 4003 - Genetics (3.0 cr)
Take 2 or more course(s) from the following:
•BIOL 3409 *{Inactive}*(3.0 cr)
•BIOL 3407 *{Inactive}*(3.0 cr)
or BIOL 3408W *{Inactive}*[WI] (3.0 cr)
or EEB 3807 - Ecology (4.0 cr)
•BIOL 3411 *{Inactive}*(3.0 cr)
or EEB 3811W - Animal Behavior in the Field [WI] (4.0 cr)

EEB Major Electives
The 13 credits include the field/lab experience, upper division EEB requirement, and additional electives as needed. Field/lab experience courses can count in other areas of the major. Directed research must be completed for a minimum of 4 credits and a maximum of 6 credits to count for the field/lab experience; credits can be split over multiple terms using 4994, 4794W, or both. Contact the EEB director of undergraduate studies to discuss alternative options for the field/lab experience.
Take 13 or more credit(s) from the following:
Field/Lab Experience
Take 4 or more credit(s) from the following:
•EEB 3807 - Ecology (4.0 cr)
•EEB 3811W - Animal Behavior in the Field [WI] (4.0 cr)
•BIOL 3820 *{Inactive}*(2.0 cr)
•BIOL 3825 *{Inactive}*(2.0 cr)
•BIOL 4035 *{Inactive}*(3.0 cr)
•BIOL 4850 *{Inactive}*(1.0 - 5.0 cr)
•BIOL 4862 *{Inactive}*(3.0 cr)
•BIOL 4894 *{Inactive}*(1.0 - 7.0 cr)
•EEB 4794W - Directed Research: Writing Intensive [WI] (3.0 - 5.0 cr)
•EEB 4801 *{Inactive}*(4.0 cr)
•EEB 4809 *{Inactive}*(3.0 cr)
•EEB 4814 *{Inactive}*(4.0 cr)
•EEB 4817 *{Inactive}*(4.0 cr)
•EEB 4825 *{Inactive}*(2.0 cr)
•EEB 4839 - Field Studies in Mammalogy (4.0 cr)

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•EEB 4842 *{Inactive}*(4.0 cr)
•EEB 4844 - Field Ornithology (3.0 cr)
•EEB 4994 - Directed Research (1.0 - 6.0 cr)
•EEB 5605 *{Inactive}*(2.0 cr)

•Upper Division EEB

Take 7 or more credit(s) from the following:
•EEB 3603 - Science, Protection, and Management of Aquatic Environments (3.0 cr)
•EEB 4014 *{Inactive}*(3.0 cr)
•EEB 4068 - Plant Physiological Ecology (3.0 cr)
•EEB 4129 - Mammalogy (4.0 cr)
•EEB 4134 - Introduction to Ornithology (4.0 cr)
•EEB 4329 - Primate Ecology and Social Behavior (3.0 cr)
•EEB 4330W - Animal Communication [WI] (3.0 cr)
•EEB 4611 - Biogeochemical Processes (3.0 cr)
•EEB 4631 *{Inactive}*(4.0 cr)
•EEB 4793W - Directed Studies: Writing Intensive [WI] (1.0 - 7.0 cr)
•EEB 4794W - Directed Research: Writing Intensive [WI] (3.0 - 5.0 cr)
•EEB 4801 *{Inactive}*(4.0 cr)
•EEB 4809 *{Inactive}*(3.0 cr)
•EEB 4814 *{Inactive}*(4.0 cr)
•EEB 4817 *{Inactive}*(4.0 cr)
•EEB 4825 *{Inactive}*(2.0 cr)
•EEB 4839 - Field Studies in Mammalogy (4.0 cr)
•EEB 4842 *{Inactive}*(4.0 cr)
•EEB 4844 - Field Ornithology (3.0 cr)
•EEB 4993 - Directed Studies (1.0 - 7.0 cr)
•EEB 4994 - Directed Research (1.0 - 6.0 cr)
•EEB 5001 *{Inactive}*(3.0 cr)
•EEB 5042 - Quantitative Genetics (3.0 cr)
•EEB 5033 *{Inactive}*(4.0 cr)
•EEB 5053 - Ecology: Theory and Concepts (4.0 cr)
•EEB 5068 - Plant Physiological Ecology (3.0 cr)
•EEB 5146 *{Inactive}*(3.0 cr)
•EEB 5221 *{Inactive}*(3.0 cr)
•EEB 5321 *{Inactive}*(3.0 cr)
•EEB 5322 *{Inactive}*(3.0 cr)
•EEB 5323 *{Inactive}*(2.0 cr)
•EEB 5327 *{Inactive}*(3.0 cr)
•EEB 5371 - Principles of Systematics (3.0 cr)
•EEB 5601 - Limnology (3.0 cr)
•EEB 5605 *{Inactive}*(2.0 cr)
•EEB 3963 *{Inactive}*(3.0 cr)
or EEB 5963 *{Inactive}*(3.0 cr)
•EEB 4609W - Ecosystem Ecology [ENV, WI] (3.0 cr)
or EEB 5609 - Ecosystem Ecology (3.0 cr)
•EEB 3002 - Sex, Evolution, and Behavior: Examining Human Evolutionary Biology (4.0 cr)
or ANTH 3002 - Sex, Evolution, and Behavior: Examining Human Evolutionary Biology (4.0 cr)

•Additional Electives

Take 0 - 6 credit(s) from the following:
•BIOC 3960 *{Inactive}*(1.0 cr)
•BIOC 4025W - Laboratory in Biochemistry [WI] (2.0 cr)
•BIOC 4125 - Laboratory in Molecular Biology and Biotechnology (3.0 cr)
•BIOC 4185 *{Inactive}*(3.0 cr)
•BIOC 4225 - Laboratory in NMR Techniques (1.0 cr)
•BIOC 4325 - Laboratory in Mass Spectrometry (1.0 cr)
•BIOC 4331 - Biochemistry I: Structure, Catalysis, and Metabolism in Biological Systems (4.0 cr)
•BIOC 4332 - Biochemistry II: Molecular Mechanisms of Signal Transduction and Gene Expression (4.0 cr)
•BIOC 4521 - Introduction to Physical Biochemistry (3.0 cr)
•BIOC 4793W - Directed Studies: Writing Intensive [WI] (1.0 - 7.0 cr)
•BIOC 4794W - Directed Research: Writing Intensive [WI] (3.0 - 5.0 cr)
•BIOC 4950 *{Inactive}*(3.0 cr)
•BIOC 4960 - Special Topics in Biochemistry (3.0 cr)
•BIOC 4993 - Directed Studies (1.0 - 7.0 cr)
•BIOC 4994 - Directed Research (1.0 - 7.0 cr)
•BIOC 5001 *{Inactive}*(5.0 cr)
•BIOC 5213 *{Inactive}*(3.0 cr)

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- BIOC 5225 - Graduate Laboratory in NMR Techniques (1.0 cr)
- BIOC 5309 - Biocatalysis and Biodegradation (3.0 cr)
- BIOC 5352 - Biotechnology and Bioengineering for Biochemists (3.0 cr)
- BIOC 5353 *{Inactive}*(3.0 cr)
- BIOC 5361 - Microbial Genomics and Bioinformatics (3.0 cr)
- BIOC 5444 - Muscle (3.0 cr)
- BIOC 5527 *{Inactive}*(4.0 cr)
- BIOC 5528 - Spectroscopy and Kinetics (4.0 cr)
- BIOC 5531 *{Inactive}*(1.0 cr)
- BIOC 5532 *{Inactive}*(1.0 cr)
- BIOC 5960 - Biophysical Spectroscopy (2.0 cr)
- PMB 3002 - Plant Biology: Function (2.0 cr)
- PMB 3005W - Plant Function Laboratory [WI] (2.0 cr)
- PMB 3007W - Plant, Algal, and Fungal Diversity and Adaptation [WI] (4.0 cr)
- BIOL 3209 - Understanding the Evolution-Creationism Controversy [CIV] (3.0 cr)
- BIOL 3211 - Physiology of Humans and Other Animals (3.0 cr)
- BIOL 3272 - Applied Biostatistics (4.0 cr)
- BIOL 3407 *{Inactive}*(3.0 cr)
- BIOL 3408W *{Inactive}*[WI] (3.0 cr)
- BIOL 3409 *{Inactive}*(3.0 cr)
- BIOL 3411 *{Inactive}*(3.0 cr)
- BIOL 3503 - Biology of Aging (2.0 cr)
- BIOL 3600 - Directed Instruction (1.0 - 2.0 cr)
- BIOL 3700 - Special Topics in Biology (1.0 - 3.0 cr)
- EEB 3807 - Ecology (4.0 cr)
- EEB 3811W - Animal Behavior in the Field [WI] (4.0 cr)
- BIOL 3820 *{Inactive}*(2.0 cr)
- BIOL 3825 *{Inactive}*(2.0 cr)
- BIOL 3961H - Communicating in the Biological Sciences (1.0 cr)
- BIOL 4004 - Cell Biology (3.0 cr)
- BIOL 4035 *{Inactive}*(3.0 cr)
- BIOL 4501 *{Inactive}*(3.0 cr)
- BIOL 4700 *{Inactive}*(3.0 cr)
- BIOL 4793W - Directed Studies: Writing Intensive [WI] (1.0 - 7.0 cr)
- BIOL 4794W - Directed Research: Writing Intensive [WI] (3.0 - 5.0 cr)
- BIOL 4850 *{Inactive}*(1.0 - 5.0 cr)
- BIOL 4862 *{Inactive}*(3.0 cr)
- BIOL 4894 *{Inactive}*(1.0 - 7.0 cr)
- BIOL 4950 - Special Topics in Biology (1.0 - 4.0 cr)
- BIOL 4993 - Directed Studies (1.0 - 7.0 cr)
- BIOL 4994 - Directed Research (1.0 - 7.0 cr)
- BIOL 5407 *{Inactive}*(3.0 cr)
- BIOL 5409 *{Inactive}*(3.0 cr)
- BIOL 5485 *{Inactive}*(3.0 cr)
- BIOL 5950 - Special Topics (1.0 - 4.0 cr)
- GCD 3485 - Bioinformatic Analysis: Introduction to the Computational Characterization of Genes and Proteins (4.0 cr)
- GCD 4025 - Cell Biology, Development & Regeneration Laboratory (3.0 cr)
- GCD 4034 - Molecular Genetics and Genomics (3.0 cr)
- GCD 4111 - Histology: Cell and Tissue Organization (4.0 cr)
- GCD 4134 *{Inactive}*(3.0 cr)
- GCD 4143 - Human Genetics and Genomics (3.0 cr)
- GCD 4151 - Molecular Biology of Cancer (3.0 cr)
- GCD 4161 - Developmental Biology (3.0 cr)
- GCD 4171 - Stem Cells in Biology and Medicine (3.0 cr)
- GCD 4793W - Directed Studies: Writing Intensive [WI] (1.0 - 7.0 cr)
- GCD 4794W - Directed Research: Writing Intensive [WI] (3.0 - 5.0 cr)
- GCD 4993 - Directed Studies (1.0 - 7.0 cr)
- GCD 4994 - Directed Research (1.0 - 7.0 cr)
- GCD 5036 - Molecular Cell Biology (3.0 cr)
- PMB 4111 - Microbial Physiology and Diversity (3.0 cr)
- PMB 4121 - Microbial Ecology and Applied Microbiology (3.0 cr)
- MICB 4131 - Immunology (3.0 cr)
- MICB 4141W *{Inactive}*[WI] (4.0 cr)
- MICB 4151 - Molecular and Genetic Bases for Microbial Diseases (3.0 cr)
- MICB 4161W - Eukaryotic Microbiology [WI] (3.0 cr)
- MICB 4171 - Biology, Genetics, and Pathogenesis of Viruses (3.0 cr)

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- MICB 4215 - Advanced Laboratory: Microbial Physiology and Diversity (3.0 cr)
- MICB 4225W - Advanced Laboratory: Microbial Genetics [WI] (3.0 cr)
- MICB 4235 - Advanced Laboratory: Virology, Immunology, and Microbial Genetics (3.0 cr)
- MICB 4793W - Directed Studies: Writing Intensive [WI] (1.0 - 7.0 cr)
- MICB 4794W - Directed Research: Writing Intensive [WI] (3.0 - 5.0 cr)
- MICB 4993 - Directed Studies (1.0 - 7.0 cr)
- MICB 4994 - Directed Research (1.0 - 7.0 cr)
- NSCI 3001W - Neuroscience and Society [CIV, WI] (4.0 cr)
- NSCI 3101 - Neurobiology I: Molecules, Cells, and Systems (3.0 cr)
- NSCI 3102W - Neurobiology II: Perception and Behavior [WI] (3.0 cr)
- NSCI 4101 - Development of the Nervous System: Cellular and Molecular Mechanisms (3.0 cr)
- NSCI 4105 - Neurobiology Laboratory I (3.0 cr)
- NSCI 4150 - Advanced Topics in Neuroscience (3.0 cr)
- NSCI 4167 *{Inactive}*(1.0 - 3.0 cr)
- NSCI 4793W - Directed Studies: Writing Intensive [WI] (1.0 - 6.0 cr)
- NSCI 4794W - Directed Research: Writing Intensive [WI] (3.0 - 5.0 cr)
- NSCI 4993 - Directed Studies (1.0 - 7.0 cr)
- NSCI 4994 - Directed Research (1.0 - 6.0 cr)
- NSC 5031W - Perception [WI] (3.0 cr)
- NSC 5037 *{Inactive}*(3.0 cr)
- NSC 5040 - Brain Networks: From Connectivity to Dynamics (4.0 cr)
- NSC 5201 *{Inactive}*(3.0 cr)
- NSC 5202 - Theoretical Neuroscience: Systems and Information Processing (3.0 cr)
- NSC 5203 - Basic and Clinical Vision Science (3.0 cr)
- NSC 5461 - Cellular and Molecular Neuroscience (3.0 cr)
- NSC 5462 - Neuroscience Principles of Drug Abuse (2.0 cr)
- NSC 5481 *{Inactive}*(3.0 cr)
- NSC 5661 - Behavioral Neuroscience (2.0 cr)
- NSC 5667 *{Inactive}*(2.0 - 3.0 cr)
- NSC 5668 *{Inactive}*(2.0 cr)
- PMB 4321 - Minnesota Flora (3.0 cr)
- PMB 4404 *{Inactive}*(3.0 cr)
- PMB 4511 - Flowering Plant Diversity (3.0 cr)
- PMB 4516W - Plant Cell Biology: Writing Intensive [WI] (3.0 cr)
- PMB 4601 - Topics in Plant Biochemistry (3.0 cr)
- PMB 4793W - Directed Studies: Writing Intensive [WI] (1.0 - 7.0 cr)
- PMB 4794W - Directed Research: Writing Intensive [WI] (3.0 - 5.0 cr)
- PMB 4993 - Directed Studies (1.0 - 7.0 cr)
- PMB 4994 - Directed Research (1.0 - 7.0 cr)
- PMB 5109 *{Inactive}*(2.0 cr)
- PMB 5301 *{Inactive}*(3.0 cr)
- BIOL 5309 - Molecular Ecology And Ecological Genomics (3.0 cr)
- PMB 5412 - Plant Physiology and Development (3.0 cr)
- PMB 5514 *{Inactive}*(3.0 cr)
- PMB 5516 *{Inactive}*(3.0 cr)
- PMB 5601 - Topics in Plant Biochemistry (3.0 cr)
- PMB 5960 *{Inactive}*(1.0 - 3.0 cr)
- FW 4136 - Ichthyology (4.0 cr)
- MATH 3283W - Sequences, Series, and Foundations: Writing Intensive [WI] (4.0 cr)
- VPM 4131 - Immunology (3.0 cr)
- MICB 3301 - Biology of Microorganisms (5.0 cr)
  or MICB 3303 - Biology of Microorganisms (without laboratory) (3.0 cr)

Program Sub-plans

A sub-plan is not required for this program.

Honors UHP

This is an honors sub-plan.

Students admitted to the University Honors Program (UHP) must fulfill UHP requirements in addition to degree program requirements. Honors courses used to fulfill degree program requirements will also fulfill UHP requirements.

Current departmental honors course offerings are listed at:
http://www.honors.umn.edu/academics/curriculum/dept_courses_current.html.

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Honors students complete an honors thesis project in the final year, most often in conjunction with an honors thesis course, or with an honors directed studies or honors directed research course. Students select honors courses and plan for a thesis project in consultation with their UHP adviser and their departmental faculty adviser.

BIOL 2960H and 3960H are strongly recommended for CBS sophomores and juniors, respectively. Directed research is the basis for an honors thesis completed in conjunction with BIOL 4960H.

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